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(54) **APPARATUS AND METHOD FOR MANIPULATING IMAGES**

VORRICHTUNG UND VERFAHREN ZUR BILDMANIPULATION

APPAREIL ET PROCEDE DE MANIPULATION D'IMAGES

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Description

TECHNICAL FIELD

[0001] This invention relates to methods and apparatus for manipulating images; and in particular to methods and apparatus for reproducing personalized images on consumer goods at locations remote from a user. The preferred embodiment includes on-line product-based image manipulation software.

BACKGROUND

[0002] There has been an increasing consumer desire for self-differentiation, particularly for differentiating mass-marketed personal items. This can be clearly seen in the recent popularity of customized mobile phone ring-tones and fascias. In order to provide personalized graphics on consumer products, there has therefore been a need for a quick and easy-to-use graphics manipulation suite to allow users to make product-specific designs, particularly from locations remote from the main image storage and printing facility. However, providing such a graphics manipulation suite over the Internet has not proved easy.

[0003] One problem stems from the open nature of the Internet itself. In order to allow Internet users to visit hundreds of thousands of unverified web sites, and yet still protect the user's computer from viruses and malicious hackers, a browser must not allow the web sites to access files on the user's computer. Thus, browsers are "dummy terminals," albeit very powerful ones; it is not easy to actively "do" anything with an Internet browser - it simply navigates between online resources and presents information and images to the user. Thus, for designing a graphical image for application to a personal item, an internet user may be able to manipulate images within the browser environment, but will not be able to save the images.

[0004] The problem of manipulating images to be applied to an article remote from the user has previously been solved in two ways, each of which has disadvantages. In one solution, a user manipulates images on his or her own machine without the use of a browser. This solution has the advantage of being extremely fast once installed on the local machine, but suffers from three major failings. First, in order to allow the program to run on the client machine, the user must first download a program. This takes time, and is inconvenient, because the software cannot be seen or tested until it is fully downloaded. Next, the program must be installed on the user's machine, where it will remain permanently until removed. This occupies storage space on the client hard drive, slows down the user's computer, and can cause system crashes. Finally, the downloaded program may have computer viruses.

[0005] In another image manipulation solution, an image is manipulated directly on a server using Java Applets, or another plug-in that functions in a similar fashion, such as a custom ActiveX control. Each time the user uses the interface to make a manipulation to the image, a separate call is made to the server, the server software changes the image's position, and sends back the information to the client machine. The theoretical advantages of Java and similar programs are that they can run on any client machine with identical results; and that the software does not need to be installed on the client machine, because the Java Applet runs within a Java Virtual Machine of the browser. However, the problem with Java and similar programs is that the Internet simply is not fast enough to provide a pleasant user experience. Also, in practice, because the Java Applet does not know which type of machine it will be run on, it can react very differently from one machine to the next.

[0006] European Patent Publication No. 0378956A discloses a method and system for editing photos over the Internet, US2002/0057454 for editing printed materials over the Internet.

[0007] German Patent Publication No. 100 55649 discloses a method for personalising images which are applied to products.

[0008] Korean Patent Publication No. 2002-0033704 discloses a method for editing a design of a credit card.

SUMMARY

[0009] In one embodiment according to the invention, there is disclosed a transaction card image personalization computer system for manipulation of images according to claim 1.

[0010] In related embodiments, the image held at the image store may be of a relatively higher resolution than the graphical representation of at least a portion of the image. The image processor may further comprise means for communicating a version of the image, comprising the applied manipulations, to an image printing means maintained securely from the user interface. The computer system may further comprise means for associating a unique identifier with the user applying the manipulations to the graphical representation; wherein the internet communications link is operable to transfer the unique identifier between the user interface and the image processor. The image processor may also comprise means for receiving a hash value, which relates to the user who applied the manipulations to the graphical representation. The browser-based user interface may be presented on a kiosk accessible to a consumer. The computer

system may also further comprise a database capable of storing the information about the manipulations applied to the graphical representation; such that a manipulation can be applied to the image held in the image store, other than in real time, or alternatively, allowing printing tasks to different articles to be batched. The computer system may further comprise a printer for printing an image, produced by applying the manipulations that emulate those applied to the graphical representation, onto a transaction card.

[0011] In another embodiment according to the invention, there is disclosed a method of operating a transaction card image personalization computer system according to claim 7.

[0012] In related embodiments, the method may further comprise transferring a unique identifier between the user interface and the image processor, the unique identifier being associated with the user applying the manipulations to the graphical representation. The method may also comprise receiving a hash value at the image processor, the hash value relating to the user applying the manipulations to the graphical representation; or presenting the browser-based user interface on a kiosk accessible to a consumer. The method may also further comprise storing information about the manipulations applied to the graphical representation in a database, such that the manipulations can be applied to the image held in the image store, other than in real time, or alternatively, allowing printing tasks to different articles to be batched. The method may also comprise printing an image, produced by applying the manipulations that emulate those applied to the graphical representation, onto a transaction card.

[0013] In another embodiment according to the invention, there is disclosed a transaction card image personalization computer program product according to claim 13.

[0014] In related embodiments, the system may further comprise a front end server for presenting the user interface; and a back end server, comprising the image processor, for communicating with the front end server and with the image store. The front end server may further comprises means for communicating a user manipulation data string to the back end server. The graphical representation of the original image may comprise a re-sized version of the original image. The user manipulations may comprise operations selected from rotating, re-sizing, positioning, flipping, controlling brightness, performing red-eye reduction, and adjusting opacity levels. The user manipulation data may further comprise data relating to at least one image for overlaying onto the original image. The at least one image for overlaying may comprise at least one transparent portion.

BRIEF DESCRIPTION OF THE DRAWINGS

[0015] For a better understanding of the present invention, and to show how the same may be carried into effect, reference will now be made, by way of example only, to the accompanying drawings, in which:

Fig. 1 illustrates a computer system for remote manipulation of images, in accordance with an embodiment of the present invention;

Fig. 2 illustrates a method of operating a computer system for remote manipulation of images, in accordance with an embodiment of the present invention;

Figs. 3-10 show screens of a credit card design website, operated in accordance with an embodiment of the invention; Fig. 11 illustrates a method of operating a computer system for remote manipulation of images, using a unique customer identifier, in accordance with an embodiment of the present invention;

Fig. 12 illustrates a method of operating a computer system for remote manipulation of images, using a hash value to avoid the need for creating and maintaining a unique customer identifier through the card application and printing lifecycle, in accordance with an embodiment of the present invention;

Fig. 13 illustrates a system according to an embodiment of the invention, in which an image is designed using a card-issuing kiosk or in-store instant issue system; and

Fig. 14 illustrates a system in which a database is used to store information between a user's image selections and back end image production, in accordance with an embodiment of the invention.

DETAILED DESCRIPTION

[0016] An embodiment according to the invention allows a user to manipulate an image through a browser interface, and is divided into two software portions, here referred to as front end software and back end software.

[0017] The front end software operates entirely within an Internet browser and in most cases does not require a download, because it accepts the limitations of the browser. In one embodiment, the front end software runs Flash software, available from Macromedia Inc. of 600 Townsend Street, San Francisco, CA 94103, U.S.A., or equivalent software. The front end software is a pure Graphical User Interface (GUI), and allows a user to design and edit graphics on his or her screen in order to build a representation of a desired image. Representations of stock (starting) images can be presented to a user in an on-screen image library and/or created by the user on demand. The image desired for output can be made up from one or several representative components, each of which has its position defined relative

to an origin, and can be manipulated based on a set of predetermined rules - such as, for example, rules allowing the image or its components to be resized, rotated, flipped, mirrored and moved relative to other components. The representative graphical components can be used, for example, to build relatively complex designs consisting of a plurality of different layers and/or transparencies constructed using Flash scenes.

[0018] When the design is completed, in an embodiment according to the invention, instructions about what the final image looks like are sent to the back end software, which runs on a server. In the preferred embodiment, these instructions are sent together (simultaneously) after the manipulation is completed, and take the form of a text string for each component of the image. For example, the text string `makeImage.aspx` for a graphics component might read:

`id+=030, x=182, y=32.3, flip=yes, rotate=270, scale=190.6, user=230`

where `id` is an image identifier; `x` and `y` define the position of a component relative to a predetermined origin; `flip`, `rotate`, and `scale` define manipulations of types generally well known in the art; and `user` is a number identifying the user. Those of skill in the art will appreciate that a range of image manipulations can be defined in this way. A resulting image may be represented by one or a number of graphical components. It is thus possible for a plurality of text strings, or an extended text string, to define an image made of a plurality of separate graphical components. The graphical components used, for example, in Flash movie scenes are generated and manipulated with a minimum of computing resources; and the designs constructed as a result can be recreated on the back end (server) side using the relevant (and generally much larger) image files. Relatively complex designs can be achieved by employing two or more image components with separate image identifiers. The image identifiers for graphical components of the same image may have a common characteristic. In accordance with embodiments of the invention, the instructions included in the text string that defines the manipulations needed to create the resultant image, need not all be included in a single text string; instead, a series of text strings may be transmitted separately to convey the same plurality of instructions. Furthermore, manipulations on the remote server need not await receipt of all of the series of text strings, but can instead be performed in stages as each string of the series is received. Regardless of the number of text strings used, an advantage of an embodiment according to the invention is that a smaller, emulated version of the image can be manipulated by the user with a minimum of computing resources, and instructions can be transferred efficiently as text strings; instead of requiring the inefficient (and time-consuming) transfer of large image files, or portions thereof, between the customer and an image-production server. Further, the need to make calls to a server with an image change each time that a single manipulation is made, is also overcome.

[0019] The back end software is responsible for generating the final image, in accordance with an embodiment of the invention, by interpreting the manipulations applied to the representation (defined in the, or each, text string file) and applying corresponding manipulations to one or more stock images held in a remote image store. The images used in the front end software are less computationally-demanding representations of those held on the server. As a result, the back end software can make image transformations that exactly mirror those which are seen on the client machine. Once the desired image has been created by the back end software, the image can be output to whatever device is required, such as a device for printing the image onto a personalized consumer item. In this way, the graphical representation is displayed and manipulated at the user interface by means of the Flash software, and only a minimal amount of information concerning the image and manipulations applied thereto need be transferred to the remote image processor.

[0020] As mentioned above, the front end software may use Macromedia's Flash, or another product. For example, the software could instead use HTML and Javascript (DHTML) without a download, although the GUI is relatively poor. Use of Flash (or equivalent) software is advantageous in that it does not allow full access to a user's local files, so that it does not risk transmitting computer viruses to the user's machine. Use of Flash software also does not require a user to install software other than the Flash plug-in, which has a high penetration of the browser market.

[0021] The preferred embodiment thus allows for on-line image manipulation by emulating the browser-based transformations (such as re-sizing or overlaying images), made by the user on a representation of the image, on the server so that the images produced can be used for personalised product creation.

[0022] On-line image manipulation is allowed by creating a two-tier architecture, in an embodiment according to the invention: there is one program that allows image manipulation on the screen in front of a user, and a second program on a server that emulates these manipulations, so that the images can be output for personalised product creation. In the preferred embodiment, the back end process, or elements of it, can be performed in a secure computing environment; and customised images can be printed onto an actual product under very high security (for example, bank level security). In this way, a user with internet access can design customised images for printing on a remote product which requires secure treatment, such as bank level security. For example, anti-fraud and anti-theft measures mean that the production

of credit cards, and other types of transaction cards, is performed in secure locations. Customisation of the designs applied to such cards is thus possible, using preferred embodiments, without the need to give the user direct computing access to the secure environment.

[0023] An online image-editing tool uses the browser environment of HTML and Macromedia Flash as a Graphical User Interface for remote software that emulates the actions taken on the client machine, in an embodiment according to the invention. This enables a fast experience for the user and a high quality end product. However, the browser-based, client-side environment allowing manipulation by the user need not necessarily be Flash from Macromedia. Any equivalent software tool capable of providing the required functionality could be used - for example, any tool capable of generating a representation of an image, applying manipulations thereto, and transferring the results through a set of commands to the server-side software, such that an image processor on the server side can emulate the actions of the front end and create a result image that can be saved to the server. The front end software will allow the upload of images from the user's computer to the server, so that the user's own images can be manipulated and overlaid with "stock" images and borders. Then, by communicating with the back end software, it is possible to produce personalized goods for a user. Such personalized goods may include, for example, credit cards, debit cards, mobile phone covers, mugs, T-shirts, gift cards, and framed prints.

[0024] An embodiment according to the invention has the advantage that high quality images do not need to be uploaded to the customer's browser during the manipulation process, because lightweight, web-enabled formats are instead used for the user's experience, thereby making the system fast and easy to use. However, when the information is transferred, the original high quality images are used to give high quality print results. An embodiment according to the invention also allows the provision of light-weight but fast graphics manipulation, without the complication of downloading programs. Additionally, a user interface according to the invention is not constantly calling to the server; thus the interface is quick and pleasant to use, and internet bandwidth is used efficiently. As another advantage of an embodiment of the invention, the original image is not transferred over the internet at the manipulation stage, so that the possibilities for hacking the image are greatly reduced. Also, because the interface runs within the Macromedia Flash environment, the interface is platform independent. Further, because the final image may be created on a server controlled by a single company, the final image output may be made to have a standardized size and resolution. This enables easy integration with printers, simplifies the production of a personalized product, and simplifies billing on a per-image basis.

[0025] By way of example, Figs. 1 and 2 describe the production of a credit card, in accordance with an embodiment of the invention.

[0026] In the embodiment of Fig. 1, a customer accesses software according to the invention, after having applied for a credit card through a web site 101 of a card issuer (such as a bank). In the first step, the card issuer issues the customer with a unique identifying number 103 which is passed to an image compilation server 108, which may (or may not) be operated by a company other than the card issuer. The card issuer associates the unique customer identifier 103 with the customer's financial information 104. This association may be performed in a financial account association table 124 maintained in an environment that is secure from the user interface. The associated customer identifier 103 and financial information 104 are passed to a bank (or other card issuer) printer server 109 via a firewall 102. Next, the customer enters the front end software 105, which may be operated by a website server or other front end server. The customer chooses an image 107 - In Fig. 1, from the customer's computer hard drive 106, and uploads it to the image compilation server 108. The image 107 could come from any suitable source such as an image library maintained by an operator of the image compilation server 108. Back end software 110, running on the image compilation server 108, now enters the original image into a database and generates a web-friendly smaller copy 111 to send to the front end software 105. The customer now performs image manipulations 112 (such as resizing, rotating, and placing the image), as the customer desires. The back end software 110 associates the customer image selection, and subsequent manipulations and selections, with the unique customer identifier 103. Next, the customer chooses another image 113 to overlay on top of the first image 107, and positions image 113 as desired. The overlay image 113 may, for example, be a transparent decorative frame for the uploaded image 107, and may be maintained in an image server 114. The back end software 110 transmits a web-friendly, smaller version 115 of the overlay image 113 to the customer, for use in creating a combination 116 of the original manipulated image 107 with the overlay image 113. Once customer approval 117 of the final design 116 is achieved and indicated to the front end software 105, the front end software 105 transmits a string of user manipulation data 118 to the image compilation server 108. This string 118 encapsulates the customer's image selections and manipulations. On receiving this string 118 the back end software 110 accesses the original copies of the images from an image library and performs the exact operations that the customer has chosen in the front end software 105 for the customer's final design. In this way, the back end software 110 emulates the manipulations at the user end according to the information transferred in the text string (also referred to herein as the results script). At this point the back end software 110 can output the resulting image 119 to a printer server 120, which may be performed through a firewall 121. The resulting image 119 and associated customer identifier 103 may then be passed to the bank (or other card issuer) printer server 109, which in turn accesses the financial account association table 124 to obtain the associated secure customer financial information 104. The financial information 104 and resulting image 119 may then

be sent to a credit card printer 122, which prints a customized credit card 123. All of the images that are used by the customer in the front end software 105 are issued via the back end software 110. The only information which passes to the back end software 110 from the front end software 105 (apart from requests for images) is data about how the image in front of the customer appears. This information can easily be encrypted for increased security. The number of images combined in a design is not limited to one or two (such as images 107 and 113) - the script can be easily amended for many more layers. Also, transparent frame image layers need not be selected and manipulated before a non-transparent image layer; the image layers can be designed in any order. Text can also be added to the image through a similar replication. The output image can be sent to any type of machine and thus the possible applications are very wide-ranging: the software can be applied not only to the payment card market, but also for non-payment and telephone cards. In certain embodiments, layers may be employed as templates and/or marks, referred to herein as transparencies. In one embodiment, the final image displayed on a card may be restricted to a selected pre-defined area, such as a "window" on a payment card (or other financial account access means), leaving the rest of the card free to contain functional features of the card, such as a bank logo, a payment card hologram or type indicator (such as, for example, "Visa" or "MasterCard" logos). Alternatively, some image layers may be positioned within such a selected window on the card; while other image layers (such as transparencies) are positioned outside the selected window, but surrounding the functional features of the card (such as the bank logo, payment card hologram, etc.). Also, the bank logo or other financial feature can act as a fixed template, behind which the user can move the image to a desired position.

[0027] In the embodiment of Fig. 2, in a first step 231, a customer 251 has applied to a bank (or other card issuer) online for a credit card, or is an existing customer offered the opportunity to make a new card for an existing account. In step 232, the customer clicks a link redirecting the user to a website (which may be operated by a company other than the card issuer) for designing the credit card - arriving with a unique identifier which relates to the customer's account and which will be carried with the customer throughout the customer's time on the site. In step 233, the customer identifier is used to log-in; alternatively, the customer could log-in separately at this point and recollect the customer's identifier. Since the design website uses only the customer identifier to identify the customer, it does not obtain any of the customer's financial details. In step 234, the customer elects to upload an image from the customer's own computer 252, such as a scanned or photographed image. In step 235, the image is uploaded to an image server, and may be held in a database 253 for convenience. In step 236, the customer enters browser-based image manipulation software 254. In step 237, the image manipulation software requests a series of images in web-friendly formats from an image re-size tool 255, so that the process is fast and quick to use. In step 238, the image re-sizing tool requests the original image from the database 253; in step 239, the original image is returned and re-sized to a web-friendly format and size; and in step 240, a set of web-friendly images is returned to the image manipulation software 254 (these are graphical representations of the original images on which manipulations can be performed). Once the customer has achieved the desired effect by manipulating the series of images required, the associated image manipulation commands are sent 241 to an image manipulation emulator 256. Image manipulation commands can include, for example, rotating, re-sizing, positioning, flipping, scaling, brightness controls, red-eye reduction, opacity levels, and other manipulations. In step 242, the image manipulation emulator 256 then requests the original images from the image server so that the best quality image is used. Upon receiving the images in step 243, the emulator 256 then repeats the completed transformations of the customer and creates an image that emulates the one created online, but that uses the original, higher quality graphics. In step 244, this image, and the associated customer identifier, is sent to the bank's printer 257. The financial data corresponding to the customer identifier is obtained, via a secure connection 258 to the bank (or other card issuer); and the printing process set in motion.

[0028] In an embodiment according to the invention that places personalized images onto plastic/ credit card-style cards, it is necessary to ensure a very high level of security. Therefore, in circumstances where there are already financial records in place for the user, the architecture receives a unique non-sequential customer identifier, which matches with a set of financial records, from the credit card issuer. This customer identifier is passed through each element of the system and is returned with the generated image file. Thus in a "mail merge"-type operation, the customer's personalized image can be matched up with the customer's financial and personal records, so that the correct image is placed on the card. At no time does either the front end or back end software have any financial information. The customer identifier may be used in an automated log-in process. In this way, the software (both the front end and back end software) can know whether the user is new or not. A returning visitor can thus be presented with images that were uploaded on a previous visit.

[0029] The system's architecture comprises two distinct elements, in an embodiment according to the invention. The front end element, the element that the user interacts with, is built in Macromedia Flash. This element allows the user to design a card by manipulating (through scaling, rotating, or performing other manipulations such as those given above) the image uploaded and then overlaying the image with frames that can contain transparent sections. Since Flash does not have "local permissions" on the client machine, as it is a browser-based interface, it is not capable of saving the final design. It therefore sends a string of instructions to the second, serverside element. The second, serverside element may be written in C#, although Java, C, C++, or any other suitable language would be equally capable. The string of

instructions may be sent as a "querystring," i.e. as part of the URL; for example, the string could be formatted as: (createpage.aspx?here_are_the_string_of_instructions&rotate=90&flip=yes...)

Other methods may also be used for transmitting the user's design manipulations, such as using an HTML style "form," or writing the information to a Cookie and then re-reading the information. Alternatively, the hypertext transfer protocol commands HTTP "POST" and HTTP "GET" may be used to pass data from the user session to the server. HTTP "POST" works in an identical fashion to a standard website form; while HTTP "GET" works by changing the URL. For example, an HTTP "GET" could change a URL, in order to transfer a user's rotation, scaling, and other selections, to read: <http://www.personalcad.net/saveinfo.aspx?rotate=90&flip=no&scale=232&x=232&y=128&y2=343&x2=333> etc.

[0030] This list of techniques for transmitting the manipulation results is not intended to be exhaustive. Alternatives and future developed techniques will also be suitable.

[0031] The customer identifier may be passed using Session State (the webserver's Session Object) or by passing as part of the "querystring," in accordance with an embodiment of the invention. HTML "forms" could achieve the same ends.

[0032] In accordance with an embodiment of the invention, an image can be uploaded as a JPEG, GIF, Bitmap, PNG, Tiff etc.; although it will be appreciated that nearly any digital image can be uploaded or output. From the original uploaded image the system creates four separate versions:

1. A thumbnail version (as a JPEG) - see the interface screenshots, below. The image is approximately 1 to 2K in file size.
2. A larger, but still web-optimized version (this is scaled to allow the image to be expanded to the maximum available by the interface - such as scaling 250% - and still have one-to-one pixel matching (i.e. the image size is width 241 x 250% if possible). This is the image used on screen for the design of the card.
3. A Bitmap image at the same scale as the original image. A Bitmap image may be used, for example, in a system that uses C#, which is a Microsoft language and uses Bitmap as the default image type.
4. The output design, which may be sized in proportion to a credit card. This design could be of any software format that is useful to the printer used, such as BMP (Bitmap) or PNG (Portable Network Graphic).

[0033] The original images may be placed into a database once they have been uploaded. In one embodiment, each request for images requires going back to the original version to use; however, this need not be the case, because once another image version has been created (e.g. a thumbnail version), the system can equally store this version so that the processing is reduced (though memory taken would increase). A key benefit of an embodiment according to the invention is that it is not necessary to pass the largest image backwards and forwards across the web from client to server, except for the initial upload of images. Nonetheless, when the final edited design or image is generated, the highest quality image is used. -

[0034] In an embodiment according to the invention, the user designs, on screen, an image that appears the same physical size as a credit card using the screen resolution of 72 dpi. This is because a computer monitor cannot present images at a higher resolution than this. However, a printer can output at higher resolutions, typically 300 dpi or greater - increasing the quality. Although the front end software uses the low resolution images, the final design is compiled by the back end software using a full scale, bitmap version of the original image uploaded. This may be achieved by using a "virtual canvas" within the back end software that is larger than the design canvas within the front end software. Thus the design being created by the back end software is laid on to a background of greater size than in the front end software (while maintaining 72 dpi resolution). Thus, if the credit card size in pixels is 241 by 153 then, by laying the image on a "virtual canvas" credit card of, 1050 by 672 at 72 dpi, the resolution can be increased to approximately 300 dpi when the credit card is finally printed (back at 3.3 inch by 2.1 inch). This method ensures that the maximum dpi achievable (to the printer's maximum setting) is output from the back end software, but only the resolution necessary is sent to the front end software. This reduces the memory requirements of the client machine and the Internet traffic. This operation could equally be achieved by changing the resolution of a 72 dpi image to 300 at the original size.

[0035] In order to use transparencies, in an embodiment according to the invention, the images containing a transparent layer (usually frames or borders) must be converted into Flash "movies" themselves. This process can be manual, but can also be automated to allow images with transparencies (such as bitmaps or PNG) to be imported into the front end software "on the fly." The back end software can use the original PNG or BMP image to generate the credit card image.

[0036] Figs. 3-10 show screens of a credit card design website operated in a series of steps according to an embodiment of the invention. Fig. 3 shows a first screen, with a standard library of images assigned to the particular card issuer that is using the credit card design website, on the left of the screen. Fig. 4 shows a screen allowing users to log in so that they can load new images in to the left hand side library. This can be automated in live versions. In Fig. 5, the upload allows the user to browse his or her own computer for images to upload. Fig. 6 shows a screen with a new library including both the user's images and a set of stock images. In the screen of Fig. 7, by clicking on the thumbnail image on the left hand side, the bigger but still web-optimized image is loaded. At this point it can be scaled, flipped, rotated, or undergo

other manipulations; and the card details can be viewed or hidden. In the screen of Fig. 8, frames can then be added. These are Flash (.swf) files that allow transparencies. Again they can be flipped, scaled, rotated, or undergo other manipulations; and the card details can be hidden. In the screen of Fig. 9, by clicking on the red Back Button or on the Step 1 tab, the user can return to a previous screen. At this point the image is shown as "live" but the frame can be seen as well. The screen of Fig. 10 shows the final version of the credit card before it is sent off to the back end software to be created.

[0037] In accordance with a further embodiment of the invention, shown in Fig. 12, a bank or other card issuer need not create a unique identifier for a customer, and pass that identifier through the card issuer's own system. Given the complexity of banking systems, avoiding the need to create such an identifier can be an advantage.

[0038] Before illustrating the alternative of Fig. 12, Fig. 11 first illustrates an embodiment that may be useful for some card issuers, in which a unique identifier is created for each customer. In this embodiment, a unique identifier is created for each customer that requests to design a card 1101, and passed 1102 to the back end server 1103. The back end server 1103 creates an image corresponding to the customer's unique identifier; and the card issuer 1104 passes the unique identifier through the card issuer's own system. A bureau 1105 that creates the final card can then make a software call to the back end server 1103 using the unique identifier, so that the account details received from the card issuer 1104 may be associated with the image.

[0039] In further detail, the embodiment of Fig. 11 functions as follows. Upon a customer requesting to a card issuer 1104 to design a personalized card 1101, the card issuer 1104 creates a unique identifier and passes the identifier 1102 to the back end server 1103. Once the customer designs the card 1106, the user and corresponding unique identifier are returned 1107 to the card issuer, and the back end server stores 1125 the customer image and unique identifier. The information that the customer has requested a new card is then sent 1108 to the card issuer's systems, along with the unique identifier; and a record and unique identifier for the customer are stored 1109 in the card issuer's systems. The card issuer then passes 1110 the unique identifier to the back end server, to notify it that the new card will potentially be created and embossed. The back end server 1103 and/or card issuer 1104 can then perform an image checking procedure 1111 and 1112, to ensure that the image designed by the customer is acceptable for production. If the image fails the back end server's image checking 1111, the unique identifier and reason for the image's rejection is then sent to the card issuer 1113; and the customer is invited 1114 to redesign the card. Once the image has been accepted, the card issuer converts 1115 the customer's record and unique identifier into an emboss record, which is sent 1116 to the bureau 1105 that will be creating the card. The back end server tags the image 1117 to be sent to the bureau 1105 in the next batch of images; and, when a suitable number of images are ready, sends 1118 the image and associated unique identifier to the bureau 1105. The bureau 1105 next stores 1119 the customer's emboss record and unique identifier, obtained from the card issuer 1104; and also stores 1120 the unique identifier and image, obtained from the back end server 1103. Having done so, the bureau 1105 can now create the finished card, by first obtaining 1121 the customer's record provided by the card issuer 1104; and also using 1122 the unique identifier to obtain the associated customer image and provide it to a blank card stock printer. The blank stock printer may then print 1123 the image onto blank stock, and encode the card's magnetic strip. Based on information in the magnetic strip, the emboss record and printed card stock may then be joined together 1124 to create a finished card.

[0040] By contrast with the process of Fig. 11, the embodiment of Fig. 12 allows a card issuer to avoid the need to create for each customer a unique identifier that must be passed through the card issuer's system. Instead, the card issuer creates a "hash value," such as a message digest, or other one-way code, based on some account details for each individual, so that the card issuer can pass customers' account information to the back end server in a way that is completely safe. Referring to Fig. 12, the process is similar to that of Fig. 11, with a card issuer 1204, a back end server 1203, and bureau 1205 performing analogous steps (1201 and following) to those of Fig. 11 (1101 and following). However, a principal difference is found in steps 1202, 1207, 1210, 1213, 1226, and 1227 of Fig. 12, in which a "hash value" (or other one-way code) is passed between the card issuer 1204 and the back end server 1203, instead of requiring the card issuer to create a unique identifier for each customer, as in Fig. 11. First, in step 1202, a hash of a unique part of the customer record (such as the customer's name) is created. A one-way hash, such as the MD5 hash, is a process that takes arbitrary-sized input data (such as a customer's name and account number), and generates a fixed-size output, called a hash (or hash value). A hash has the following properties: (i) it should be computationally infeasible to find another input string that will generate the same hash value; and (ii) the hash does not reveal anything about the input that was used to generate it. This means that the hash function used in the embodiment of Fig. 12 allows the card issuer 1204 to pass at least some of a customer's account information to the back end server 1203 in a way that is completely secure. As seen in steps 1202, 1207, 1210, 1213, 1226, and 1227, a hash value may be passed back and forth between the card issuer 1204 and the back end server 1203, without the need for the card issuer 1204 to create a unique identifier and pass it through its system.

[0041] In further detail, the embodiment of Fig. 12 functions as follows. Upon a customer requesting to a card issuer 1204 to design a personalized card 1201, the card issuer 1204 creates a hash value of a unique part of the customer's record 1202 and passes the hash value 1226 to the back end server 1203. Once the customer designs the card 1206,

the user and corresponding hash value are returned 1207 to the card issuer, and the back end server stores 1225 the customer image and hash value. The information that the customer has requested a new card is then sent 1208 to the card issuer's systems; and a record for the customer is stored 1209 in the card issuer's systems. The card issuer then recreates 1210 the hash value that is based on the unique part of the customer record, and passes it 1227 to the back end server 1203, to notify it that the new card will potentially be created and embossed. The back end server 1203 and/or card issuer 1204 can then perform an image checking procedure 1211 and 1212, to ensure that the image designed by the customer is acceptable for production. If the image fails the back end server's image checking 1211, the hash value and reason for the image's rejection is then sent to the card issuer 1213; and the customer is invited 1214 to redesign the card. Once the image has been accepted, the card issuer converts 1215 the customer's record into an emboss record, which is sent 1216 to the bureau 1205 that will be creating the card. The back end server tags the image 1217 to be sent to the bureau 1205 in the next batch of images; and, when a suitable number of images are ready, sends 1218 the image and associated hash value to the bureau 1205. The bureau 1205 next stores 1219 the customer's emboss record, obtained from the card issuer 1204; and also stores 1220 the hash value and image, obtained from the back end server 1203. Having done so, the bureau 1205 can now create the finished card, by first obtaining 1221 the customer's record provided by the card issuer 1204; and also using 1222 the hash value to obtain the associated customer image and provide it to a blank card stock printer. The blank stock printer may then print 1223 the image onto blank stock, and encode the card's magnetic strip. Based on information in the magnetic strip, the emboss record and printed card stock may then be joined together 1224 to create a finished card.

[0042] In an alternative to the embodiment of Figs. 11 and 12, which utilize a unique identifier and a hash value, respectively, other methods of creating a secure user identifier may be used. For example, it is also possible for the user information to be encrypted at the card issuer at the beginning of the process, and decrypted at the card bureau using a Private/Public Key or a Private/Private Key encryption technology. This alternative works in a manner similar to the process described in Fig. 12, but with modified security measures; for example, the key must be held by the card bureau. [0043] In another embodiment according to the invention, a secure identifier of the image that is produced based on the user's instructions, may be embedded in the image itself, or embedded as part of the data file in which the image is stored. For example, a hash key, encrypted identifier, or other secure identifier may be passed through the back end server (such as server 1103 or 1203) in association with the user's image manipulation instructions. At any point in the back end server process, such as when the image is produced for sending to a card bureau (such as card bureau 1205), the image then can be made to have the secure identifier embedded in it - such as by embedding a bar code or other machine-readable code, which encodes the secure identifier, placed in the image itself. In this way, the card bureau 1205 can read the bar code, or other embedded secure identifier, directly from the image itself; and need not acquire any information from the back end server 1203 except for the image itself, which includes the bar code. This embodiment finds particular use in the case where the card production process of the bureau 1205 involves using an image printer, which is not capable of separately storing or passing on the secure identifier. Thus, by using the embedded secure identifier, the image printer can effectively pass on the secure identifier as well as the image to the embossing stage, simply by passing on the printed image itself, which will include the bar code (or other embedded machine-readable identifier). The embossing stage can then involve reading the bar code (or other embedded machine-readable identifier) from the image, and looking up the associated emboss record for use in final card production. It should be noted that the image printing function of bureau 1205 need not be performed within a single organization or enterprise; for example, the image printing may instead be performed by a separate enterprise or department from the organization that performs the embossing. In accordance with an embodiment of the invention, it will be appreciated that a variety of different techniques can be used for embedding the secure identifier in the image, such as by including the identifier in the metadata of the image file; including both when the image file is transmitted to the bureau 1205, or when the image file is in use by the back end server or the bureau.

[0044] In another embodiment according to the invention, shown in Fig. 13, a modified architecture may be used, in the context of a card-issuing kiosk or in-store "instant issue" system. As with embodiments described above, front end software runs on a client-side browser; and back end software runs on a remote webserver. However, unlike in the above embodiments, the card printer is located on the client machine (such as a card-issuing kiosk). With reference to Fig. 13, a user browser housed in an in-store kiosk 1302 uses the front end software, which is provided from an internet server 1301, to allow a customer to design a personalized card. The user's image preferences are then saved and the image is generated 1303 on the remote webserver. The image can then be returned to the kiosk 1304, and printed to the customer's card 1305. Images may be checked on the remote server side, to ensure that they are suitable for printing, in real time, if required. Otherwise the operation of the system may be similar to the embodiments described above.

[0045] In a further embodiment according to the invention, shown in Fig. 14, a database can be used to store information between the user's image selections, and the back end image production. In this way, the system can be made more scalable, since it does not need to create the images on the back end in real time. As with the other embodiments, the user first makes image selections on the front end interface software, and the image manipulations are passed to the back end server 1401. Then, however, each user's manipulations are saved to a database 1402; so that the back end

software can pick up each manipulation, not in real time, and make the high resolution image 1403.

[0046] While the foregoing has described what is considered to be the best mode and, where appropriate, other modes of performing the invention, the invention should not be limited to specific apparatus configurations or method steps disclosed in this description of the preferred embodiment. Those skilled in the art will also recognize that the invention has a broad range of applications, and that the embodiments admit of a wide range of modifications without departing from the scope of the invention as defined by the appended claims.

Claims

1. A computer system for the manipulation of images for application to personalised financial transaction cards, the computer system comprising:

an image store (114,253);

an image processor (110,256);

means for generating a browser-based user interface (105,254) for displaying for manipulation on a remote terminal a graphical representation (111, 115) of at least a portion of an original image (107) held at the image store (114,253), said browser-based user interface being capable of effecting a plurality of manipulations to the graphical representation;

an image resizer (255) arranged to generate a graphical representation of said original image, wherein said graphical representation comprises a resized version of the original image such that the graphical representation is displayable for manipulation at said remote terminal;

an Internet communications link arranged to couple the browser-based user interface to the image processor, wherein a user at said remote terminal can use said browser-based user interface to upload an original image such that it is transferred via said Internet communications link to said image store, and wherein the link is operable to receive information about said manipulations applied to the graphical representation and transfer said information between the browser-based user interface and the image processor, and said image processor is operable to access the original image held at the image store to apply manipulations emulating those applied to the graphical representation at the remote terminal; and

means for communicating a version of the original image comprising the applied manipulations to a financial transaction cards printing means (122, 257) maintained securely from the browser-based user interface.

2. A computer system according to claim 1, wherein the image (107) held at the image store (114, 253) is of a relatively higher resolution than the graphical representation (111, 115) of at least a portion of the image (107).

3. A computer system according to claim 1, further comprising means for associating a unique identifier (103) with the user applying the manipulations to the graphical representation (111, 115); wherein the Internet communications link is operable to transfer the unique identifier (103) between the user interface (105, 254) and the image processor (110, 256).

4. A computer system according to claim 1, wherein the image processor (110, 256) comprises means for receiving a hash value, which relates to the user who applied the manipulations to the graphical representation (111, 115).

5. A computer system according to claim 1, wherein the browser-based user interface (105, 254) is presented on a kiosk accessible to a consumer.

6. A computer system according to claim 1, further comprising a database capable of storing the information about the manipulations applied to the graphical representation (111,115); such that a manipulation can be applied to the image held in the image store (114, 253), other than in real time, or alternatively, allowing printing tasks to different articles to be batched.

7. A method of operating a computer system for manipulation of images to be applied to personalised financial transaction cards, the method comprising:

providing an Internet communications link coupling a browser-based user interface (105, 254) operable at a remote terminal to an image processor (110, 256) of the computer system;

receiving an original image uploaded by a user at the browser-based user interface of the remote terminal and transferring said image to an image store (114, 253) of the computer system via said Internet communications link,

generating a graphical representation of at least a portion of said original image, said graphical representation comprising a resized version of the original image;
 displaying said graphical representation for manipulation at the browser-based user interface, wherein a plurality of manipulations to the graphical representation are effected using said browser-based user interface;
 5 transferring information about manipulations applied to the graphical representation at the remote terminal between the browser-based user interface and the image processor via said Internet communications link, causing the image processor to access the image store and apply, to at least a portion of the original image held in the image store, manipulations emulating those applied to the graphical representation at the remote terminal; and
 10 causing the image processor to communicate a version of the original image comprising the applied manipulations to a financial transaction cards printing means maintained securely from the browser-based user interface.

8. A method according to claim 7, further comprising:

15 transferring a unique identifier (103) between the user interface (105, 254) and the image processor (110, 256), the unique identifier (103) being associated with the user applying the manipulations to the graphical representation (111, 115).

9. A method according to claim 7, further comprising:

20 receiving a hash value at the image processor (110, 256), the hash value relating to the user applying the manipulations to the graphical representation (111, 115).

10. A method according to claim 7, further comprising:

25 presenting the browser-based user interface (105, 254) on a kiosk accessible to a consumer.

11. A method according to claim 7, further comprising:

30 storing information about the manipulations applied to the graphical representation in a database, such that the manipulations can be applied to the image (107) held in the image store (114, 253), other than in real time, or alternatively, allowing printing tasks to different articles to be batched.

12. A method according to claim 7, further comprising:

35 printing an image, produced by applying the manipulations that emulate those applied to the graphical representation (111, 115), onto a transaction card.

13. A computer program product for the personalisation of an image to be applied to a financial transaction card comprising program code means, said program code means including:

first code means for providing an Internet communications link coupling a user interface of a remote terminal to an image processor (110, 256) of the computer system;
 second code means for receiving an original image uploaded by a user at the remote terminal and transferring said image to an image store (114, 253) of the computer system via said Internet communications link;
 45 third code means for generating a graphical representation of at least a portion of said image, said graphical representation comprising a resized version of the original image;
 fourth code means for displaying said graphical representation for manipulation at a browser-based user interface, wherein said browser-based user interface is operable to allow a user to effect a plurality of manipulations to said graphical representation;
 50 fifth code means for transferring information about manipulations applied to the graphical representation at the remote terminal between the browser-based user interface and the image processor via said Internet communications link;
 sixth code means for causing the image processor to access the remote image store and apply, to at least a portion of the original image held in the image store, manipulations emulating those applied to the graphical representation at the remote terminal; and
 55 seventh code means for causing the image processor to communicate a version of the original image comprising the applied manipulations to a financial transaction cards printing means maintained securely from the browser-

based user interface.

14. A system according to claim 1, further comprising:

- 5 a front end server for presenting the user interface; and
a back end server (110), comprising the image processor (110, 256), for communicating with the front end server and with the image store (114, 253).
- 15 15. A system according to claim 14, wherein the front end server further comprises means for communicating a user manipulation data string to the back end server.
- 16. A system according to claim 1, wherein the user manipulations comprise operations selected from rotating, re-sizing, positioning, flipping, controlling brightness, performing red-eye reduction, and adjusting opacity levels.
- 15 17. A system according to claim 1, wherein user manipulation data further comprises data relating to at least one image (113) for overlaying onto the original image (107).
- 18. A system according to claim 17, wherein the at least one image (113) for overlaying comprises at least one transparent portion.
- 20 19. A system according to claim 1, wherein the browser-based user interface (105, 254) is operable such that a user can define an image desired for output as being made up from one or several representative components, each of which has its position defined relative to an origin and can be manipulated based on a set of predetermined rules.
- 25 20. A system according to claim 1, wherein the browser-based user interface (105, 254) comprises front end software operable entirely within an internet browser.
- 21. A system of according to claim 1, wherein instructions defining the image of the completed design are sent to the image processor (110, 256) simultaneously in the form of a text string.

Patentansprüche

- 35 1. Computersystem zur Manipulation von Bildern zur Anwendung bei bzw. Anbringung an personalisierten Finanztransaktionskarten, wobei das Computersystem umfasst:

einen Bildspeicher (114, 253);
einen Bildprozessor (110, 256);
Mittel zum Erzeugen einer browserbasierten Benutzerschnittstelle (105, 254) zum Anzeigen, zur Manipulation
40 an einem entfernten Endgerät, einer grafischen Darstellung (111, 115) zumindest eines Abschnitts eines ursprünglichen Bilds (107), das an dem Bildspeicher (114, 253) gehalten ist, wobei die browserbasierte Benutzerschnittstelle in der Lage ist, eine Mehrzahl von Manipulationen der grafischen Darstellung zu bewirken;
einen Bildgrößenanpasser bzw. -Resizer (255), der angeordnet ist, um eine grafische Darstellung des ursprünglichen Bilds zu erzeugen, wobei die grafische Darstellung eine größenangepasste bzw. resizierte Version des
45 ursprünglichen Bilds derart umfasst, dass die grafische Darstellung zur Manipulation an dem entfernten Endgerät anzeigbar ist;
eine Internet-Kommunikationsverbindung, die angeordnet ist, um die browserbasierte Benutzerschnittstelle mit dem Bildprozessor zu koppeln, wobei ein Benutzer an dem entfernten Endgerät die browserbasierte Benutzerschnittstelle verwenden kann, um ein ursprüngliches Bild hochzuladen, so dass dieses über die Internet-Kommunikationsverbindung an den Bildspeicher übertragen wird, und wobei die Verbindung wirksam ist, um Informationen über die Manipulationen zu erhalten, die an der grafischen Darstellung vorgenommen werden, und diese Informationen zwischen der browserbasierten Benutzerschnittstelle und dem Bildprozessor zu übertragen, und der Bildprozessor ist wirksam, um auf das an dem Bildspeicher gehaltene ursprüngliche Bild zuzugreifen, um Manipulationen vorzunehmen, die diejenigen emulieren, die an der grafischen Darstellung an dem entfernten
50 Endgerät vorgenommen werden; und
Mittel zum Kommunizieren einer Version des ursprünglichen Bilds, das die vorgenommenen Manipulationen umfasst, an ein Finanztransaktionskarten-Druckmittel (122, 257), das sicher von der browserbasierten Benutzerschnittstelle gehalten ist.

2. Computersystem gemäß Anspruch 1, bei dem das an dem Bildspeicher (114, 253) gehaltene Bild (107) eine relativ höhere Auflösung als die grafische Darstellung (111, 115) zumindest eines Abschnitts des Bilds (107) hat.
3. Computersystem gemäß Anspruch 1, das ferner Mittel zum Zuordnen eines eindeutigen Identifizierers (103) zu dem Benutzer umfasst, der die Manipulationen an der grafischen Darstellung (111, 115) vornimmt; wobei die Internet-Kommunikationsverbindung wirksam ist, um den eindeutigen Identifizierer (103) zwischen der Benutzerschnittstelle (105, 254) und dem Bildprozessor (110, 256) zu übertragen.
4. Computersystem gemäß Anspruch 1, bei dem der Bildprozessor (110, 256) Mittel zum Empfangen eines Hash-Werts umfasst, der sich auf den Benutzer bezieht, der die Manipulationen an der grafischen Darstellung (111, 115) vorgenommen hat.
5. Computersystem gemäß Anspruch 1, bei dem die browserbasierte Benutzerschnittstelle (105, 254) auf einem Kiosk präsentiert wird, der für einen Kunden bzw. Benutzer zugänglich ist.
6. Computersystem gemäß Anspruch 1, das ferner eine Datenbank umfasst, die in der Lage ist, Informationen über die an der grafischen Darstellung (111, 115) vorgenommenen Manipulationen zu speichern, so dass eine Manipulation an dem in dem Bildspeicher (114, 253) gehaltenen Bild anders als in Echtzeit vorgenommen werden kann, oder die alternativ erlaubt, dass Druckaufträge für unterschiedliche Artikel batchweise verarbeitet werden.
7. Verfahren zum Betreiben eines Computersystems zur Manipulation von Bildern, die an personalisierten Finanztransaktionskarten angewendet bzw. angebracht werden sollen, wobei das Verfahren umfasst:

Bereitstellen einer Internet-Kommunikationsverbindung, die eine an einem entfernten Endgerät betätigbare browserbasierte Benutzerschnittstelle (105, 254) mit einem Bildprozessor (110, 256) des Computersystems koppelt;
Empfangen eines ursprünglichen Bilds, das von einem Benutzer an der browserbasierten Benutzerschnittstelle des entfernten Endgeräts hochgeladen wird, und Übertragen des Bilds an einen Bildspeicher (114, 253) des Computersystems über die Internet-Kommunikationsverbindung;
Erzeugen einer grafischen Darstellung von zumindest einem Abschnitt des ursprünglichen Bilds, wobei die grafische Darstellung eine größenangepasste bzw. resizierte Version des ursprünglichen Bilds umfasst;
Anzeigen der grafischen Darstellung zur Manipulation an der browserbasierten Benutzerschnittstelle, wobei eine Mehrzahl von Manipulationen der grafischen Darstellung unter Verwendung der browserbasierten Benutzerschnittstelle bewirkt wird;
Übertragen von Informationen über Manipulationen, die an der grafischen Darstellung an dem entfernten Endgerät vorgenommen werden, zwischen der browserbasierten Benutzerschnittstelle und dem Bildprozessor über die Internet-Kommunikationsverbindung;
Veranlassen, dass der Bildprozessor auf den Bildspeicher zugreift und an zumindest einem Abschnitt des ursprünglichen Bilds, das in dem Bildspeicher gehalten ist, Manipulationen vornimmt, die diejenigen emulieren, die an der grafischen Darstellung an dem entfernten Endgerät vorgenommen werden; und
Veranlassen, dass der Bildprozessor eine Version des ursprünglichen Bilds, das die vorgenommenen Manipulationen umfasst, an ein Finanztransaktionskarten-Druckmittel kommuniziert, das sicher von der browserbasierten Benutzerschnittstelle gehalten ist.
8. Verfahren gemäß Anspruch 7, das ferner umfasst:

Übertragen eines eindeutigen Identifizierers (103) zwischen der Benutzerschnittstelle (105, 254) und dem Bildprozessor (110, 256), wobei der eindeutige Identifizierer (103) dem Benutzer zugeordnet ist, der die Manipulationen an der grafischen Darstellung (111, 115) vornimmt.
9. Verfahren gemäß Anspruch 7, das ferner umfasst:

Empfangen eines Hash-Werts an dem Bildprozessor (110, 256), wobei sich der Hash-Wert auf den Benutzer bezieht, der die Manipulationen an der grafischen Darstellung (111, 115) vornimmt.
10. Verfahren gemäß Anspruch 7, das ferner umfasst:

Präsentieren der browserbasierten Benutzerschnittstelle (105, 254) auf einem Kiosk, der für einen Kunden bzw.

Benutzer zugänglich ist.

11. Verfahren gemäß Anspruch 7, das ferner umfasst:

- Speichern von Informationen über die an der grafischen Darstellung vorgenommenen Manipulationen in der Datenbank, so dass die Manipulationen an dem in dem Bildspeicher (114, 253) gehaltenen Bild (107) anders als in Echtzeit vorgenommen werden können, oder alternativ Erlauben, dass Druckaufträge für unterschiedliche Artikel batchweise verarbeitet werden.

12. Verfahren gemäß Anspruch 7, das ferner umfasst:

Drucken eines Bilds, das durch Vornehmen der Manipulationen, die diejenigen emulieren, die an der grafischen Darstellung (111, 115) vorgenommen werden, auf eine Transaktionskarte.

13. Computerprogrammprodukt für die Personalisierung eines Bilds, das an einer Finanztransaktionskarte angewendet bzw. angebracht werden soll, das Programmcodemittel umfasst, wobei die Programmcodemittel enthalten:

- erste Codemittel zum Bereitstellen einer Internet-Kommunikationsverbindung, die eine Benutzerschnittstelle eines entfernten Endgeräts mit einem Bildprozessor (110, 256) des Computersystems koppelt;
 zweite Codemittel zum Empfangen eines ursprünglichen Bilds, das von einem Benutzer an dem entfernten Endgerät hochgeladen wird, und Übertragen des Bilds an einen Bildspeicher (114, 253) des Computersystems über die Internet-Kommunikationsverbindung;
 dritte Codemittel zum Erzeugen einer grafischen Darstellung von zumindest einem Abschnitt des Bilds, wobei die grafische Darstellung eine größenangepasste bzw. resizierte Version des ursprünglichen Bilds umfasst;
 vierte Codemittel zum Anzeigen der grafischen Darstellung zur Manipulation an einer browserbasierten Benutzerschnittstelle, wobei die browserbasierte Benutzerschnittstelle wirksam ist, um einem Benutzer zu erlauben, eine Mehrzahl von Manipulationen der grafischen Darstellung zu bewirken;
 fünfte Codemittel zum Übertragen von Informationen über Manipulationen, die an der grafischen Darstellung an dem entfernten Endgerät vorgenommen werden, zwischen der browserbasierten Benutzerschnittstelle und dem Bildprozessor über die Internet-Kommunikationsverbindung;
 sechste Codemittel zum Veranlassen, dass der Bildprozessor auf den entfernten Bildspeicher zugreift und an zumindest einem Abschnitt des ursprünglichen Bilds, das in dem Bildspeicher gehalten ist, Manipulationen vornimmt, die diejenigen emulieren, die an der grafischen Darstellung an dem entfernten Endgerät vorgenommen werden; und
 siebte Codemittel zum Veranlassen, dass der Bildprozessor eine Version des ursprünglichen Bilds, das die vorgenommenen Manipulationen umfasst, an ein Finanztransaktionskarten-Druckmittel kommuniziert, das sicher von der browserbasierten Benutzerschnittstelle gehalten ist.

14. System gemäß Anspruch 1, das ferner umfasst:

einen Front-End-Server zum Präsentieren der Benutzerschnittstelle; und
 einen Back-End-Server (110), der den Bildprozessor (110, 256) umfasst, zum Kommunizieren mit dem Front-End-Server und mit dem Bildspeicher (114, 253).

15. System gemäß Anspruch 14, bei dem der Front-End-Server ferner Mittel zum Kommunizieren einer Benutzermanipulationsdatenkette bzw. -String an den Back-End-Server umfasst.

16. System gemäß Anspruch 1, bei dem die Benutzermanipulationen Vorgänge umfassen, die aus Drehen, Größenanpassen bzw. Resizen, Positionieren, Umdrehen bzw. Flippen, Steuern der Helligkeit, Reduzierung von roten Augen und Anpassen der Opazitätsstufen ausgewählt ist.

17. System gemäß Anspruch 1, bei dem Benutzermanipulationsdaten ferner Daten umfassen, die sich auf zumindest ein Bild (113) zum Überlagern auf das ursprüngliche Bild (107) beziehen.

18. System gemäß Anspruch 17, bei dem zumindest ein Bild (113) zum Überlagern einen transparenten Abschnitt umfasst.

19. System gemäß Anspruch 1, bei dem die browserbasierte Benutzerschnittstelle (105, 254) derart wirksam ist, dass

ein Benutzer ein Bild, das ausgegeben werden soll, als aus einer oder mehreren repräsentativen Komponenten bestehend definieren kann, von denen jeweils die Position relativ zu einem Ursprung definiert ist und die basierend auf einem Satz vorbestimmter Regeln manipuliert werden können.

20. System gemäß Anspruch 1, bei dem die browserbasierte Benutzerschnittstelle (105, 254) eine Front-End-Software umfasst, die vollständig innerhalb eines Internetbrowsers wirksam ist.
21. System gemäß Anspruch 1, bei dem Instruktionen, die das Bild des abgeschlossenen Designs definieren, gleichzeitig in Form einer Textkette bzw. -String an den Bildprozessor (110, 256) gesendet werden.

Revendications

1. Système informatique destiné à la manipulation d'images pour application à des cartes de transactions financières, le système informatique comprenant :
 - une mémoire d'images (114, 253) ;
 - un processeur d'images (110, 256) ;
 - un moyen de générer une interface utilisateur par navigateur (105, 254) pour l'affichage en vue d'une manipulation sur un terminal distant d'une représentation graphique (111, 115) d'au moins une partie d'une image d'origine (107) conservée au niveau de la mémoire d'images (114, 253), ladite interface utilisateur par navigateur pouvant effectuer une pluralité de manipulations sur la représentation graphique ;
 - un redimensionneur d'images (255) pour générer une représentation graphique de ladite image d'origine, où ladite représentation graphique comprend une version redimensionnée de l'image d'origine de sorte que la représentation graphique puisse être affichée pour manipulation au niveau dudit terminal distant ;
 - une liaison de communications Internet agencée de manière à coupler l'interface utilisateur par navigateur au processeur d'images, où un utilisateur au niveau dudit terminal distant peut utiliser ladite interface utilisateur par navigateur pour charger une image d'origine de sorte qu'elle soit transférée par l'intermédiaire de ladite liaison de communications Internet dans ladite mémoire d'images, et où la liaison puisse être utilisée pour recevoir des informations sur lesdites manipulations appliquées à la représentation graphique et transférer lesdites informations entre l'interface utilisateur par navigateur et le processeur d'images, et que ledit processeur d'images puisse être utilisé pour accéder à l'image d'origine conservée au niveau de la mémoire d'images pour appliquer des manipulations émulant celles qui sont appliquées à la représentation graphique au niveau du terminal distant ; et
 - un moyen permettant de communiquer une version de l'image d'origine comprenant les manipulations appliquées à un moyen permettant d'imprimer des cartes de transactions financières (122,252) conservé en sécurité à l'écart de l'interface utilisateur par navigateur.
2. Système informatique selon la revendication 1, dans lequel l'image (107) conservée au niveau de la mémoire d'images (114, 253) est de résolution relativement plus élevée que la représentation graphique (111, 115) d'au moins une partie de l'image (107).
3. Système informatique selon la revendication 1, comprenant par ailleurs un moyen d'associer un identificateur unique (103) à l'utilisateur appliquant les manipulations à la représentation graphique (111, 115) ; où la liaison de communications Internet peut être utilisée pour transférer l'unique identificateur (103) entre l'interface utilisateur (105, 254) et le processeur d'images (110, 256).
4. Système informatique selon la revendication 1, dans lequel le processeur d'images (110, 256) comprend un moyen de recevoir une valeur de contrôle, relié à l'utilisateur ayant appliqué les manipulations à la représentation graphique (111, 115).
5. Système informatique selon la revendication 1, dans lequel l'interface utilisateur par navigateur (105, 254) est présenté sur un kiosque accessible au consommateur.
6. Système informatique selon la revendication 1, comprenant par ailleurs une base de données pouvant stocker les informations sur les manipulations appliquées à la représentation graphique (111, 115) ; de sorte qu'une manipulation puisse être appliquée à l'image conservée dans la mémoire d'images (114, 253) autrement qu'en temps réel ou alternativement, permettant que les tâches d'impression soient traitées par lots sur différents articles.

7. Procédé d'exploitation d'un système informatique destiné à la manipulation d'images à appliquer sur des cartes de transaction financière personnalisées, le procédé comprenant :

la fourniture d'une liaison de communications Internet couplant une interface utilisateur par navigateur (105, 254) pouvant être utilisée au niveau d'un terminal distant vers un processeur d'images (110, 258) du système informatique;
la réception d'une image d'origine chargée par un utilisateur au niveau d'une interface utilisateur par navigateur du terminal distant et le transfert de ladite image dans une mémoire d'images (114, 253) du système informatique par l'intermédiaire d'une liaison de communications Internet ;
la génération d'une représentation graphique d'au moins une partie de ladite image d'origine, ladite représentation graphique comprenant une version redimensionnée de l'image d'origine ;
l'affichage de ladite représentation graphique destinée à la manipulation au niveau de l'interface utilisateur par navigateur, où une pluralité de manipulations sur la représentation graphique est effectuée à l'aide de l'interface utilisateur par navigateur ;
le transfert d'informations sur les manipulations appliquées à la représentation graphique au niveau du terminal distant entre l'interface utilisateur par navigateur et le processeur d'images par l'intermédiaire d'une liaison de communications Internet, de sorte que
le processeur d'images puisse accéder à la mémoire d'images et d'appliquer, à au moins une partie de l'image d'origine, des manipulations émulant celles appliquées à la représentation graphique au niveau du terminal distant ; et
de sorte que le processeur d'images puisse communiquer une version de l'image d'origine comprenant les manipulations appliquées au moyen d'imprimer des cartes de transactions financières conservées en sécurité à l'écart de l'interface utilisateur par navigateur.

8. Procédé selon la revendication 7, comprenant en outre :

le transfert d'un unique identificateur (103) entre l'interface utilisateur (105, 254) et le processeur d'images (110, 258), l'unique identificateur (103) étant associé à l'utilisateur appliquant les manipulations à la représentation graphique (111, 115).

9. Procédé selon la revendication 7, comprenant en outre :

la réception d'une valeur de contrôle au niveau du processeur d'images (110, 258), la valeur de contrôle étant liée à l'utilisateur appliquant les manipulations à la représentation graphique (111, 115).

10. Procédé selon la revendication 7, comprenant en outre :

la présentation d'une interface utilisateur par navigateur (105, 254) sur un kiosque accessible au consommateur.

11. Procédé selon la revendication 7, comprenant en outre :

le stockage d'informations sur les manipulations appliquées à la représentation graphique dans une base de données, de sorte que les manipulations puissent être appliquées à l'image (107) conservée dans la mémoire d'images (114, 253), autrement qu'en temps réel ou alternativement, permettant que des tâches d'impression soient traitées par lots sur différents articles.

12. Procédé selon la revendication 7, comprenant en outre :

l'impression d'une image, produite en appliquant les manipulations qui émulent celles qui sont appliquées à la représentation graphique (111, 115), à une carte de transactions.

13. Produit de programme informatique destiné à la personnalisation d'une image à appliquer à une carte de transactions financières comprenant un moyen de codage de programme, ledit moyen codage de programme incluant :

un premier moyen de codage destiné à fournir une liaison de communications Internet couplant une interface utilisateur d'un terminal distant à un processeur d'images (110, 258) du système informatique ;
un deuxième moyen de codage destiné à recevoir une image d'origine chargée par un utilisateur au niveau du terminal distant et à transférer ladite image dans une mémoire d'images (114, 253) du système informatique

par l'intermédiaire de ladite liaison de communications Internet :

- un troisième moyen de codage destiné à générer une représentation graphique d'au moins une partie de ladite image, ladite représentation graphique comprenant une version redimensionnée de l'image d'origine ;
 - un quatrième moyen de codage destiné à l'affichage de ladite représentation graphique pour manipulation au niveau d'une interface utilisateur par navigateur, dans lequel ladite interface utilisateur par navigateur peut être utilisée pour permettre à l'utilisateur d'effectuer une pluralité de manipulations sur ladite représentation graphique ;
 - un cinquième moyen de codage destiné à transférer des informations sur les manipulations appliquées à la représentation graphique au niveau du terminal distant entre l'interface utilisateur par navigateur et le processeur d'images par l'intermédiaire de ladite liaison de communications Internet ;
 - un sixième moyen de codage destiné à faire en sorte que le processeur d'images accède à la mémoire d'images distante et applique à au moins une partie de l'image d'origine conservée dans la mémoire d'images, des manipulations émulant celles qui sont appliquées à la représentation graphique au niveau du terminal distant ; et
 - un septième moyen de codage destiné à faire en sorte que le processeur d'images communique une version de l'image d'origine comprenant les manipulations appliquées aux moyens d'impression de cartes de transactions financières conservées en sécurité à l'écart de l'interface utilisateur par navigateur.
14. Système selon la revendication 1, comprenant en outre :
- un serveur de face avant destiné à présenter l'interface utilisateur ; et
 - un serveur de face arrière (110) comprenant le processeur d'images (110, 256), destiné à communiquer avec le serveur de face avant et avec la mémoire d'images (114, 253).
15. Système selon la revendication 14, dans lequel le serveur de face avant comprend par ailleurs un moyen pour communiquer des données de manipulations de l'utilisateur au serveur de face arrière.
16. Système selon la revendication 1, dans lequel les manipulations de l'utilisateur comprennent des opérations sélectionnées à partir des niveaux de rotation, de redimensionnement, de positionnement, de basculement, de contrôle de la luminosité, de réalisation de la réduction des yeux rouges et de réglage de l'opacité.
17. Système selon la revendication 1, dans lequel les données sur les manipulations de l'utilisateur comprennent par ailleurs des données liées à au moins une image (113) destinée à la superposition sur l'image d'origine (107).
18. Système selon la revendication 17, dans lequel au moins une image (113) destinée à la superposition comprend au moins une partie transparente.
19. Système selon la revendication 1, dans lequel l'interface utilisateur par navigateur (105, 254) peut être utilisée de sorte qu'un utilisateur puisse définir une image souhaitée pour une sortie composée en tant que, un ou plusieurs composants représentatifs, chacun d'eux ayant sa position définie par rapport à une origine et pouvant être manipulé à partir d'un ensemble de règles prédéterminées.
20. Système selon la revendication 1, dans lequel l'interface utilisateur par navigateur (105, 254) comprend un logiciel de face avant pouvant être entièrement utilisée dans un navigateur Internet.
21. Système selon la revendication 1, dans lequel des consignes définissant l'image de la conception terminée sont transmises au processeur d'images (110, 256) simultanément sous la forme d'une chaîne de texte.

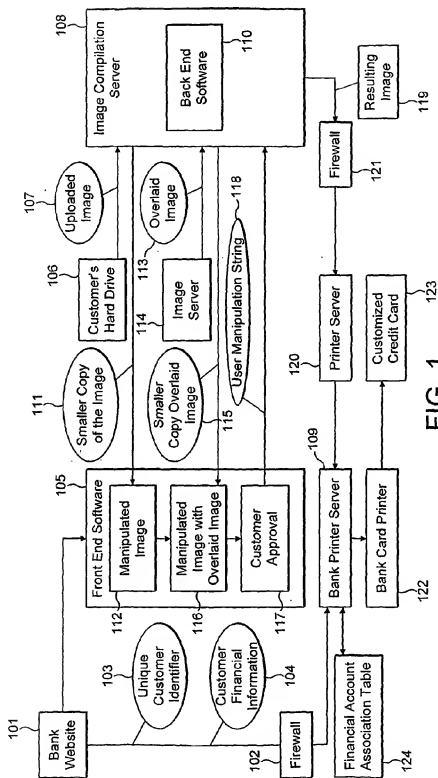


FIG. 1

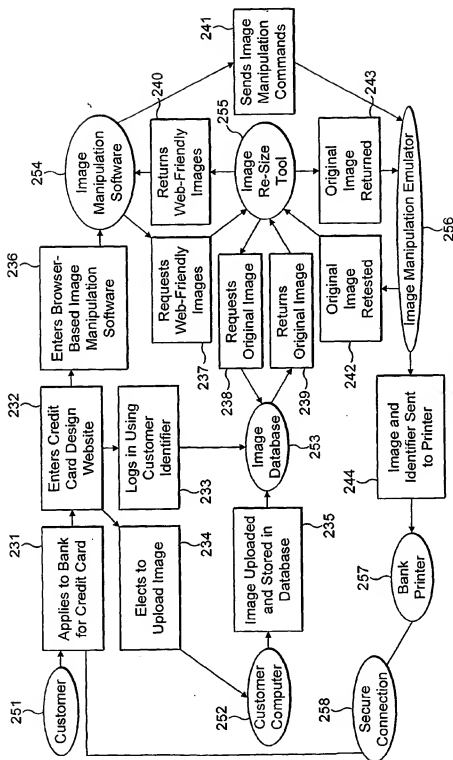


FIG. 2

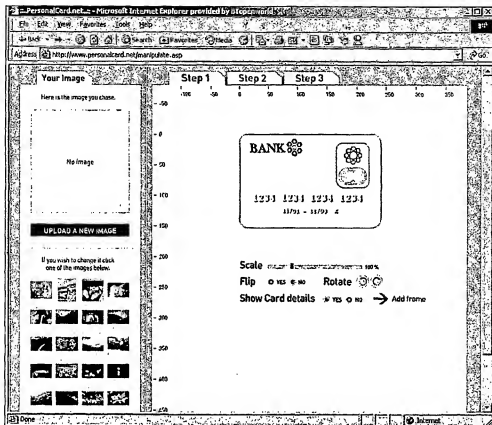


FIG. 3

The screenshot shows a web browser window titled "PersonalCard.net - Microsoft Internet Explorer provided by UT Openminut". The address bar displays "http://www.personalcard.net/login.aspx". The page layout includes a header with navigation links: "Home", "Done", "Design", "Apply", and "Login". The main content area is divided into two sections. On the left, under the "BANQUE NATIONAL" logo, is an "Information" section with the text: "Welcome to the Login Section. Please log in using the form to your right ->". On the right is the "Login" section, which contains the heading "Personalise your Credit Card" and the tagline "it's easy, it's quick & it's Unique". Below this, it says "Please login below...". A message states: "This Username & Password has already been taken. Please choose another." The login form includes fields for "Login:" and "Password:", both with input boxes. Below these fields is a checkbox labeled "I already have a username & password:" which is checked. A "Submit" button is located at the bottom of the form. The browser's status bar at the bottom shows "Done" and "Internet".

PersonalCard.net - Microsoft Internet Explorer provided by UT Openminut

File Edit View Favorites Tools Help

Go Back Forward Stop Search Favorites Print View Source

Address http://www.personalcard.net/login.aspx Go

Home Done Design Apply Login

BANQUE NATIONAL

What's your Credit Card say about you?

Information

Welcome to the Login Section
Please log in using the form to your right ->

Personalise your Credit Card
it's easy, it's quick & it's Unique

Login

Please login below...

This Username & Password has already been taken. Please choose another.

Login:

Password:

I already have a username & password: ☒

Done Internet

FIG. 4

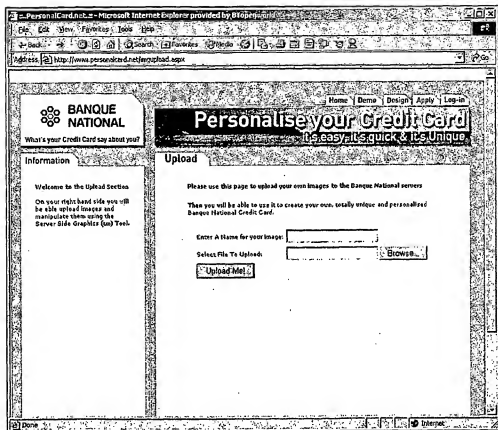


FIG. 5

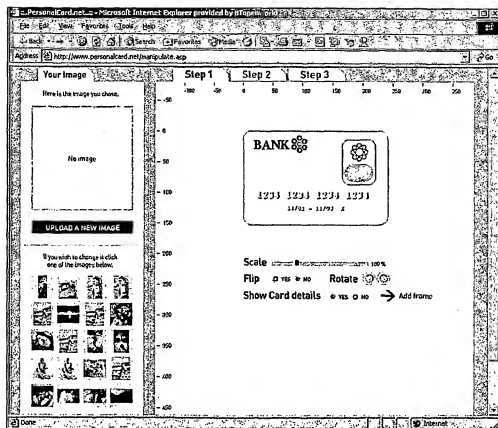


FIG. 6

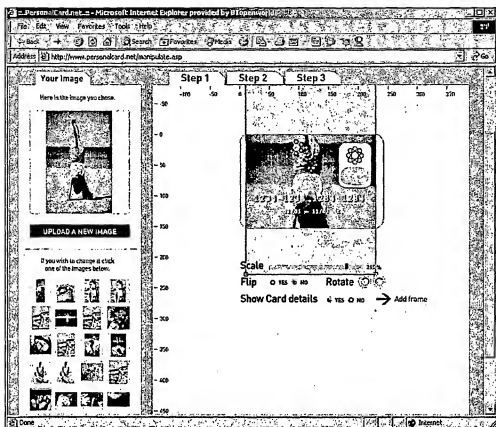


FIG. 7

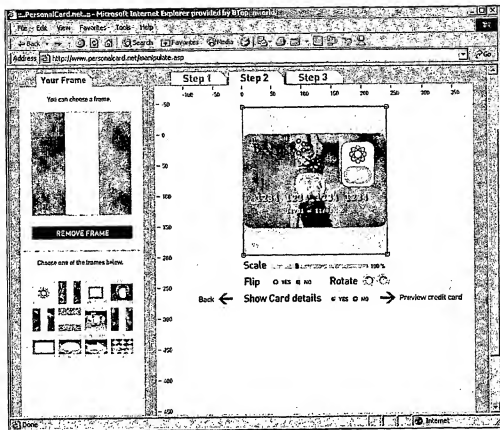


FIG. 8

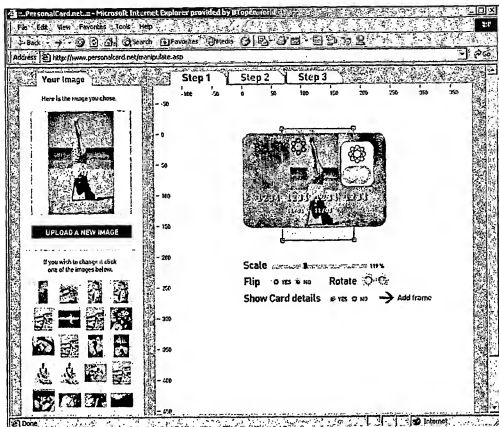


FIG. 9

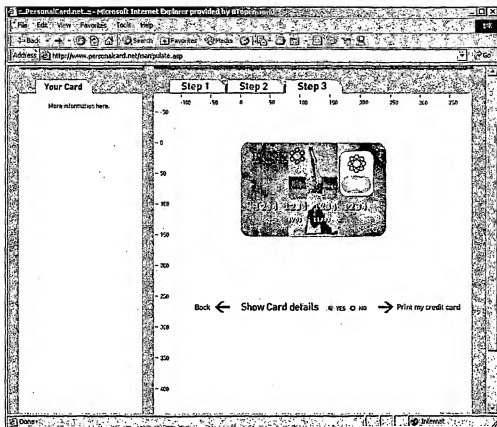


FIG. 10

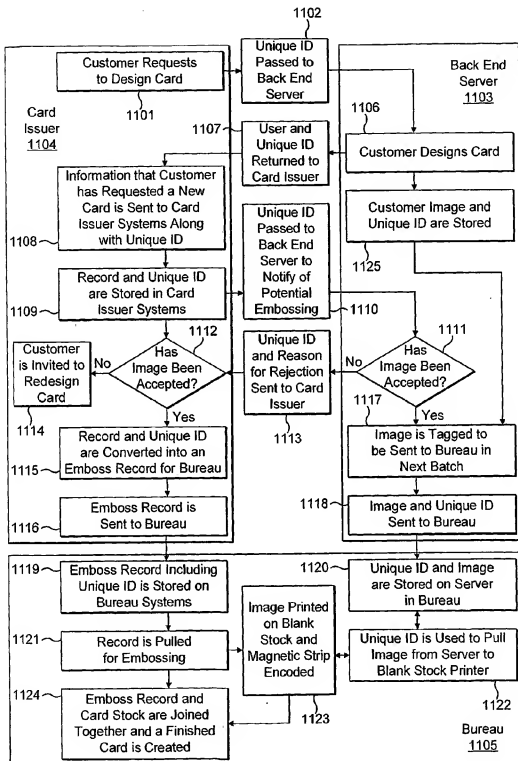


FIG. 11

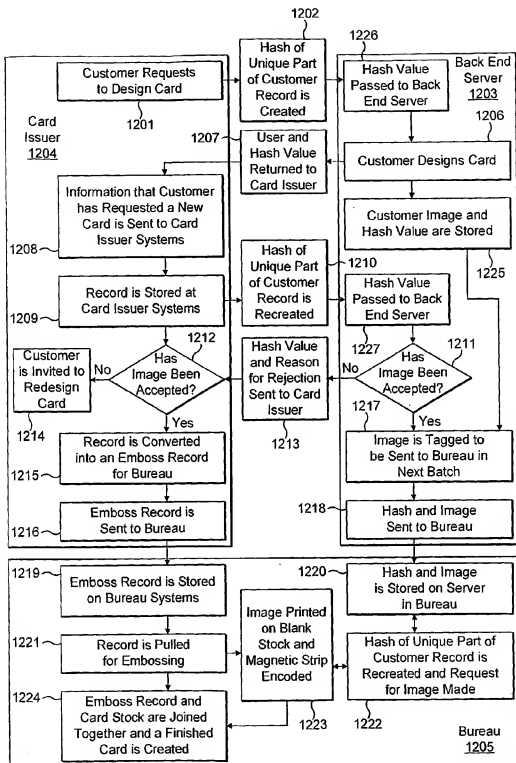


FIG. 12

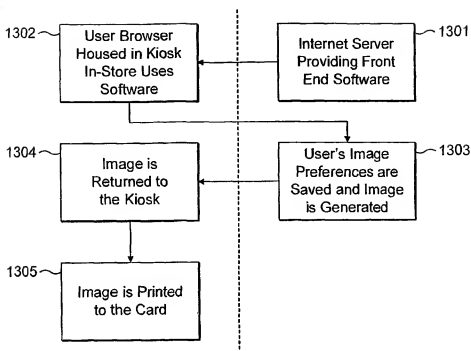


FIG. 13

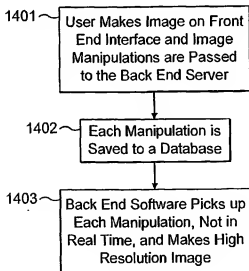


FIG. 14

REFERENCES CITED IN THE DESCRIPTION

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